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Albuquerque Operations Offic
Rocky Flats Area Offic

TE: JUN 2 8 1989

TO
OF: S&EP:CW

CT: Sampling Observations and Recommendations

TO:

R.J. Erfurdt, Director
Health, Safety and Environment
Rockwell International, AERO, RFP

Over the past weeks a number of sampling events have been conducted and observed. The parties participating in these sampling efforts include Rockwell International, R.F. Weston, the U.S. Environmental Protection Agency, and the Colorado Department of Health. Observations of these sampling events revealed a dramatic difference in sampling procedure, sample processing and preservation, and documentation.

It is felt that continuity within all concerned parties would eliminate or greatly reduce errors and aid in the understanding of the hydrologic and geochemical systems at Rocky Flats.

Listed below are selected recommendations to facilitate a better quality and representative suite of samples.

GENERAL RECOMMENDATION:

1) A Rockwell representative, familiar with project and activity goals, should be present at the field site or readily available to answer questions and offer guidance.

2) A sampling plan should be prepared and thoroughly reviewed by all participants prior to site entry. All participants are to be well versed in activity requirements, procedures and safety considerations. This plan should be present in the field at all times.

3) Calibration of field equipment should be conducted prior to leaving the "lab". It is usually not necessary to recalibrate at the site unless the crew encounters severe field conditions (large temperature fluctuations) or extreme use (dropping of the instrument).

4) Decontamination of equipment should be conducted at the "lab" whenever possible to eliminate sampling delays.

5) Multiple sets of sampling equipment should be utilized whenever possible to eliminate delays in sampling due to decontamination.

6) Additional contractor staff may facilitate the sampling process. Separate teams might be responsible for sample processing, decontamination/calibration, and/or sampling.

7) Experienced field sampling personnel will facilitate sampling and help to ensure that good quality and representative samples are collected.

8) A quality distilled water should be utilized by sampling staff for field applications. Distilled water form a grocery or hardware store is inadequate. Distilled water should be reagent type II or equivalent.

9) Training in an E.P.A. approved program for all sampling staff, including supervisors and observers, should be initiated immediately and updated on a periodic or as needed basis. This training should include sample plan preparation, sampling techniques, field parameter measurement, decontamination procedures, sample processing and preservation and documentation procedures.

Candice C. Jierree, Chief
Safety & Environmental Program Branch

Attachment

cc w/att:
G.H. Setlock, Rockwell
K.B. McKinley, Rockwell

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6/13/89 - Tuesday Sampling Episode at Ponds B-5 and A-4.

Rockwell Representatives: C. Sundblad
S. Borros

CDH Representative: A. Hazle

BDM Representative: C. Woods

10:20 Arrive in Rockwell's field vehicle at Pond B-5. Prepare to Sample.

10:30 Engineers arrive to inspect dam. 3 pickup trucks and 1 van. Notify C. Sundblad that all dams would be inspected today. Discussion of non-interference of EPA work in "A" drainage.

S. Borros carries uncapped cubitainers to pond by inserting his ungloved fingers into 3-4 containers and carrying them.

Neither CDH rep. nor Rockwell staff wearing gloves.

Sample collection is done with a plastic bucket and nylon/plastic rope, none of which was wrapped in protective material or decontaminated prior to use.

Cubitainers are placed on the ground as are other sample containers, with exception of 80 ml VOA amber glass bottle, which is in A. Hazel's pocket.

1st and 2nd casts of bucket/line device: bucket is rinsed and rinsate discarded on edge of pond in water.

3rd cast, bucket is retrieved and a 1 liter clear glass bottle filled using a plastic (Teflon?) funnel - (not wrapped in protective material or decontaminated prior to use).

From same bucket of sample - 80 ml VOA bottle filled by immersing bottle into bucket, again without gloves on hands. In process, septum falls from cap into bucket. Septum is picked out of bucket and upon placing back on cap, is dropped again, this time to the ground. The septum is picked up off the ground and placed on cap which seals the VOA container. Bottle is not inverted to check for air bubbles, but did appear to have a positive meniscus.

4th cast - upon retrieval - bucket collects all surface water. fills 1 gal. cubitainer for rads - (per A. Hazel).

5th cast - Again all surface H_2O, 1 qt. cubitainers - nitrates, non vol. etc. - plus 160 ml poly bottles.

6th cast - Again, all surface H_2O; complete filling of sample containers.

No measurement of temperature, eh, pH, or conductivity

11:00 Collection of water complete - pH is measured at vehicle. pH is 8.8 without temperature correction. pH meter was "calibrated" by placement of probe into 1 solution, not standard 4 & 10 or 4, 7, 10. Probe was placed into sample without rinse.

Samples are preserved with hydrochloric and nitric acid. Still no gloves and acids poured (not measured) into each respective sample container. pH was not measured in preserved samples.

11:05 A. Hazel placed CDH samples into his cooler. He had to borrow "blueice" from Rockwell to properly preserve his samples.

S. Borros still processing Rockwell samples.

11:10 All processing and decontamination is complete for this sample.

11:14 Prepare to leave site for Pond A-4.

11:15 Arrive Pond A-4. Prepare to collect sample. Samplers will use Rockwell's bucket/line system at this location. A. Hazel inflates a 1 gal cubitainer by breathing into it, then caps container.

The engineers are at A-4, walking along dam, conducting their inspection. One of them appears to be taking photos.

11:21 1st cast into pond, rinse bucket and discharge water 3-5 m from shore-point, dropping water back into pond.

2nd cast, same procedure as cast #1.

3rd cast, retrieve bucket and fill 1 liter clear glass bottle, using plastic/Teflon(?) funnel - (same funnel as last sample without decontamination) - to fill a 1 gallon cubitainer. After filling cubitainer, A. Hazel places funnel upside-down on ground.

4th cast, while retrieving bucket, A. Hazel places hand into bucket with sample and 80 ml amber glass container - no gloves - (VOC container?) Fill 80 ml bottle and cap - no check for air bubbles. Begin to fill 160 ml poly bottles, S. Borros submerges bottles into bucket with sample, no gloves.

S. Borros expands 1 qt cubitainer to prepare for sample collection by breathing into it. Others he expands by pulling sides apart.

11:27 Sample collection complete. Both CDH and Rockwell prep samples - preserve and document.

Upon taking pH @ truck, no rinse of probe. No temperature correction, no eh, temperature, or conductivity. Final pH: 7.93. Samples being prepared.

11:42 Prep to leave Pond A-4. End of sampling for the day.

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Sampling Episode at Ponds B-5 and A-4.

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Rockwell Representatives:	C. Sundblad S. Borros
CDH Representative:	A. Hazle
BDM Representative:	C. Woods

Observations:

1. No decontamination of sampling equipment (i.e., funnel and bucket/rope) before or between sampling episodes. Equipment was not wrapped in protective material during transport. Sample bottles were not continually capped and on at least one occasion, ungloved fingers were inserted inside the bottle. On two occasions, cubitainers were expanded by sampler exhaling into them. Funnel was placed unprotected on the ground.

2. Protective gloves were not used during sampling or handling of sampling equipment.

3. Sample containers were immersed in bucket of sample water but were not decontaminated on outside and were immersed with ungloved hands. Also, on two occasions, the septum fell from the cap, was retrieved, and placed on cap without decontamination.

4. No conductivity, eH, or temperature measurements were collected with pH. pH meter was not properly rinsed and calibrated with proper buffers. pH was not temperature corrected.

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Friday - June 16, 1989
Sample Pond C-2

A. Hazle - CDH
R. Quillan - CDH
S. Borros - Rockwell
C. Sundblad - Rockwell
C. Woods - BDM

Meet at inner east gate @ 10:00 Hrs.

10:00 - A. Hazle and R. Quillan arrive same time as Rockwell representatives. A. Hazle asks about previous sampling trip notes and I give him a list of observations (draft).

COMMENTS: A. Hazle - Misspelled "Hazel" on list. Also asks that I not use the word "excursion". Explained that the inflation of the 1 gal. cubitainer on previous trip was for rads- not organics.

C. Sundblad - Explained that the Rockwell team had approximately 15 minutes to prepare for sampling effort and that they were only running "pre-discharge" analyses - not the in depth full suite.

C. Woods - Explained that notes were observations only -not judgments.

10:15 - Sampling team arrives at pond C-2. C. Sundblad emphasizes that samples are "pre-discharge" only - not exotics - (VOA) plus chrome (total)

10:18 - Prepare to sample - S. Borros wearing latex gloves - prelables sample cubitainers. A. Hazle - also gloved - prepares sample containers. R. Quillan observes. S. Borros also calibrates pH Meter with two buffers. Caps for cubitainers in a cardboard box unprotected - not on cubitainer. Sample containers placed in canvas bag for transport to sampling point by Rockwell staff.

10:23 - Arrive at sampling point, north side of pond, near dam. Water is high, A. Hazle returns to vehicle to get rubber boots.

10:27 - A. Hazle returns and wades out to collect sample water. 1st cast using plastic bucket/rope assembly is a rinse. 2nd and 3rd casts are also rinses. 4th cast - A. Hazle collects water and returns to bank. Pours water through funnel into sample container - (Funnel was not wrapped or decontaminated). Everyone handling sample containers or equipment is gloved. Fill 2 - 1 liter clear glass bottles. Check both for positive miniscus - and ensure that there are not air bubbles. Fill 1 gal. cubitainer (rads), nitrates. It appears that these are all state samples. 5th and 6th casts - rinse bucket assembly. 7th cast, top off state's 1 gal. cubitainer.

10:35 - Fill 2-80 ml amber glass septum bottles by pouring (not immersing).

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Both bottles checked for air bubbles. Fill 2-160 ml poly. bottles and 3 1/2 1 qt. cubitainers. 8th cast, top off last cubitainer. Funnel was hand held or placed in canvas bag between casts.

10:39 - Water collection complete, pack up all equipment and go to vehicle.

10:42 - At vehicle - measure pH and begin sample preservation and documentation. pH was measured in each preserved 1 qt. cubitainer. All were below 2.

10:48 - Rockwell team and A. Hazle complete sample documentation, filling out tags and updating notebook. Final pH is 9.14. There was no temperature measured and pH meter was not temperature corrected. No conductivity or eh was measured.

10:50 - Rockwell crew realizes they forgot to collect sample for total chrome analyses. Return to pond.

10:54 - A. Hazle gloves up and returns to pond; 1st cast is to rinse bucket assembly. 2nd cast; collect chrome sample - pour through funnel (no rinse).

10:57 - Back at vehicle - chrome sample is preserved and pH measured. Rockwell crew completes sample preparation and documentation.

11:00 - CDH crew leaves pond area.

11:05 - Rockwell crew leaves site.

11:10 - Arrive @ east gate. None of the sampling equipment was recontaminated or wrapped at the sampling site prior to leaving the site. Samples were stored in an ice chest (with blue ice) at the site immediately after sample preseration and documentation.

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June 20, 1989
Sampling Episode - Rocky Flats Ponds B-5 & A-4

Participants:		
	C. Runas	- EPA
	B. Warner	- EPA
	C. Sundblad	- Rockwell
	L. Gregory-Frost	- Weston
	P. Groseth	- Weston
	K. Almquist	- Weston
	C. Woods	- BDM

8:30 - Meet C. Sundblad @ east gate. Drive to B-5 pond where I am introduced to Mr. Runas and Mr. Warner (EPA).

8:45 - Weston staff has not yet arrived although they have placed buoys in the pond - presumably to designate sampling points. C. Sundblad leaves to find Weston crew. Temperature is approximately 80°F, light breeze from SW and patchy clouds.

On drive up C. Sundblad points out construction work @ A-3 pond, north side, for slope stability.

8:55 - C. Sunblad returns, Weston is de-contaminating boat in preparation for sampling. They will be here directly.

9:10 - Weston crew arrives. They prepare to sample, and back the boat toward the pond.

Weston crew: Laurie Gregory-Frost
Patty Groseth
Karen Almquist

9:25 - They are having difficulty backing the boat trailer. We will carry the boat to the pond.

EPA staff have their sample container (1 gal. cubitainers, capped) ready to place in the boat. The pump to be used is a Geo-Pump Peristalic, battery operated. Weston will utilize new tygon tubing for each station and thoroughly rinse the pump.

Parameters -: EPA Total Metals
BNA
VOA
RADS
Bio-Monitoring

Question arises about the pH regarding the lab verses the field;

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field measurements will be taken for pH, conductivity and temperature.

9:45 - Boat is launched with L. Gregory-Frost and P. Groseth. K. Almquist leaves site for additional supplies. B. Warner prepares sample tags. The Weston crew is in the process of re-positioning buoys in the pond. C. Sundblad is updating the logbook.

10:17 - They begin collecting the first sample.

10:30 - Weston crew is still collecting the first set of samples at station 1, B-5 pond.

11:15 - Weston crew is still sampling station 1, at the northern position on B-5 pond. The sampling is going very slowly. The pump appears to be operating but at a very slow discharge. C. Sundblad leaves to pick up the Kemmerer bottle.

11:19 - Weston crew moves from station 1 to station 2, at the center position of the pond.

12:13 - Weston crew moves from station 2 toward station 3, at the southern position in the B-5 pond.

12:22 - Weston crew sets up at station 3.

12:40 - Two representatives for CDH arrive to sample the B-5 pond for RADS & VOC's. They are Mr. Rob Terry (radiation control) and Mr. Dick Gamewell.

12:45 - Mr. Terry is less than pleased about my observations of Mr. Hazle from last week and expressed himself about it. He asks if consideration was given to the plastic 1 gal. cubitainer used and I expressed that consideration was given to that circumstance. I also explained that I merely documented my observations. Mr. Terry also asked C. Sundblad about taking a sample from the discharge pipe from B-5. This would require opening the discharge valve. C. Sundblad said that it would not be possible as it may be construed as an illegal discharge. He also asked C. Sundblad about the sampling point for the C-2 pond. He asked C. Sunblad about the possibility that "they" (meaning Rockwell) provide boats and landings for each pond. It was his opinion that all the ponds would be sampled much more frequently by a variety of groups, particularly if people want to sample the middle of the pond.

12:48 - Using a plastic bucket and nylon rope assembly (this does not appear to have been decontaminated or wrapped in protective materials) for sampling, Mr. Terry makes the first cast and rinses the bucket.

The second cast is taken from the surface of the pond from which he fills the sample container. (1 gal. uncapped cubitainer,

taken from the vehicle). He is not wearing gloves as he places his fingers inside the cubitainer. While filling, Mr. Gamewell holds the cap in his ungloved hands. From the same bucket he begins to fill the 1st 80 ml. amber VOC bottle. Mr. Warner makes a comment to him about his sampling technique. Mr. Terry drops septum, picks it up and places it on the bottle after rinsing in the pond.

He fills the 2nd VOC and while the cap is off he is discussing this technique with Mr. Warner. He then dumps the sample from the 2nd VOC and re-collects it from the edge of the pond, dropping septum again. He picks it up and re-uses it. During this entire time, he is not wearing gloves. He has not checked bottles for air bubbles. During the discussion with Mr. Warner and Ms. Sundblad, the VOC and RAD sample bottles are exposed to sunlight and heat (85 - 90°F)

12:55 - Weston crew is still at station B. CDH samples are still exposed to heat as Mr. Terry begins to fill out the paperwork.

12:58 - I asked Mr. Runas his estimate of the temperature. He thought it was approximately 90°F.

12:59 - Mr. Terry checks for air bubbles in the VOC bottles, dumps and refills one of the bottles from the edge of the pond and again drops septum in to the sediment at the edge of the pond. He caps the bottle, places it in the bucket not in the cooler, then tells Ms. Sundblad of their plan to sample A-4.

13:07 - Mr. Warner asks about their sample plan and QA plan. Mr Terry says they do not have one but they are being prepared by their office.

13:10 - The boat arrives from Station 3 with their collection complete.

13:11 - Mr. Terry and Mr. Gamewell return to their vehicle with samples in the bucket - presumably to complete their documentation and preservation. Thus far, samples have not been preserved and they have been continually exposed to heat and bright sunlight.

13:15 - CDH crew leaves site.

13:23 - Weston crew process samples at the vehicle (preservation and labeling). They prepare to take field measurements.

Sample Times -	Compsites:	1036 - 1303
	Station 1	1032
	Station 2	1128
	Station 3	1220

Trip blank time: 1032
(per B. Warner)

Field Measurements: Conductivity Meter YSI 33

09:50 Hrs. 75 umhos = 78
720 umhos = 700
6680 umhos = 6630

10:00 Hrs. - pH - 7.0 = 7.00
10.0 = 10.05
4.0 = 4.05

At 10:44 Station 1 @ 7.3' below surface

pH = 8.2
Conductivity = 325
Temperature = 21°C
T.D. = 14.75

At 12:05 Station 2 @ 7.7' below surface

ph = 8.05
Conductivity = 340
Temperature = 22°C
T.D. = 15.7'

At 12:53 Station 3 @ 7.5' below surface

ph = 8.10
Conductivity = 330
Temperature = 22°C
T.D. = 14.98'

14:10 - Leave B-5 pond for east gate where we leave EPA staff. Weston crew will decontaminate boat and I leave to check in at office.

14:35 - I return to east gate.

15:25 - Weston crew arrives. Progress to A-4 pond.

15:34 - Arrive at A-4 pond.

16:05 - Boat is finally launched, Weston crew must redistribute buoys.

16:18 - Arrive station 1, A-4 pond at most northern sector.

16:35 - Pump stops working. Will use Kemmerer bottle.

17:00 - Station 1 complete. Return to shore to drop off samples then move to station 2.

17:25 - Leave station 2. Return to shore and prepare for station 3.

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17:45 - Weston crew at station 3, I leave for the day. Sampler at 3rd of 3 stations on 2nd of 4 ponds. They will stay to complete one additional pond tonight.

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